

## Route Layout Description for the DARPA Grand Challenge

Each leg of the Route is defined by two factors: a set of Waypoints and the Lateral Boundary Offset. The Track Line connects the two Waypoints and defines the middle of the leg segment. The outer boundary of the segment is defined by the Lateral Boundary Offset, which is the perpendicular distance from the Track Line to the boundary edge. In addition, the boundary is defined by a circular arc centered on the Waypoint with a radius equal to the Lateral Boundary Offset. This is shown in Figure 1.

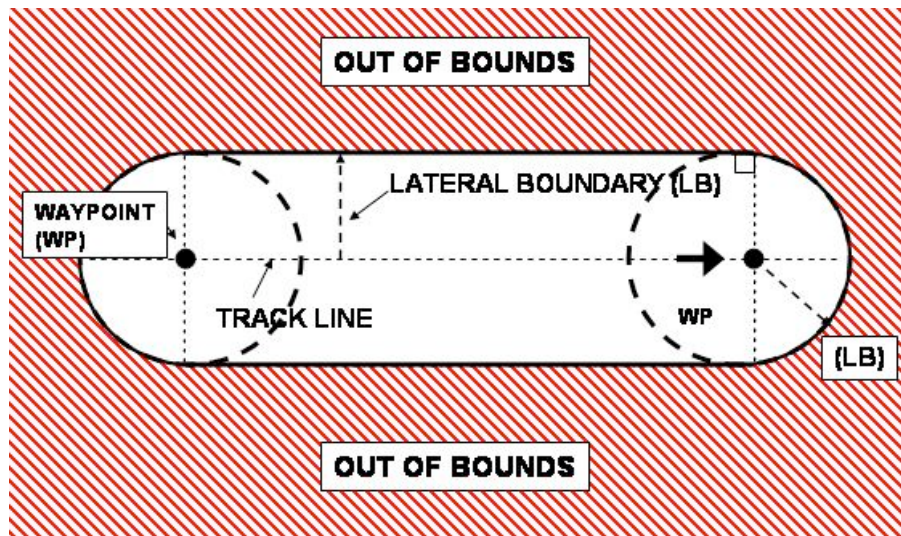


Figure 1: Leg Segment Definition

Leg Segments are connected at a Waypoint, which they both share. It is possible for a new segment to change direction, change Lateral Boundary Offset, or change both. The vehicle is considered to be “in bounds” if it falls within the boundary of any Leg Segment. The outer boundary of the Route is defined by the least restrictive Leg Segment Boundary. Several situations are shown below to illustrate this point.

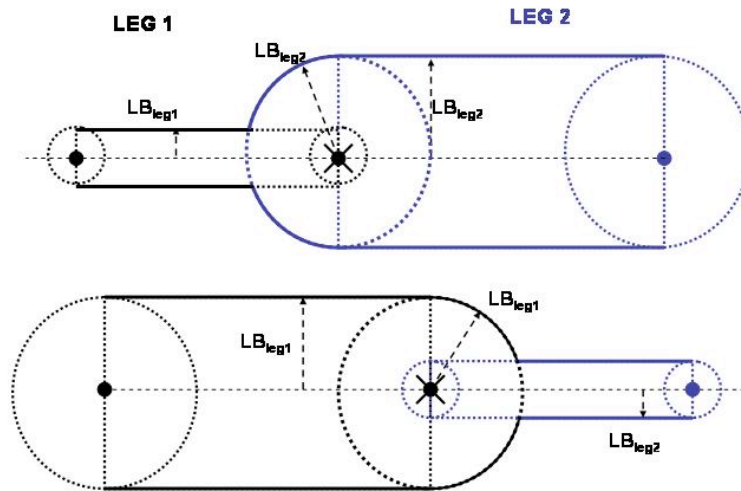


Figure 2: Changing Lateral Boundary

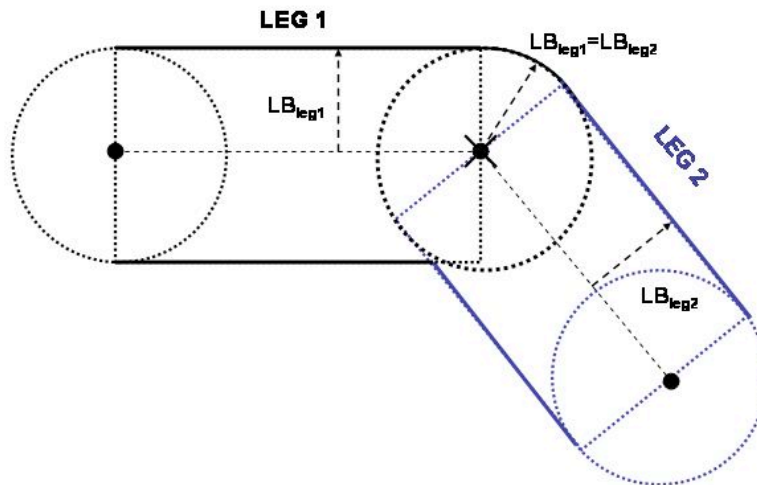


Figure 3: Change in Direction (Lateral Boundary Unchanged)

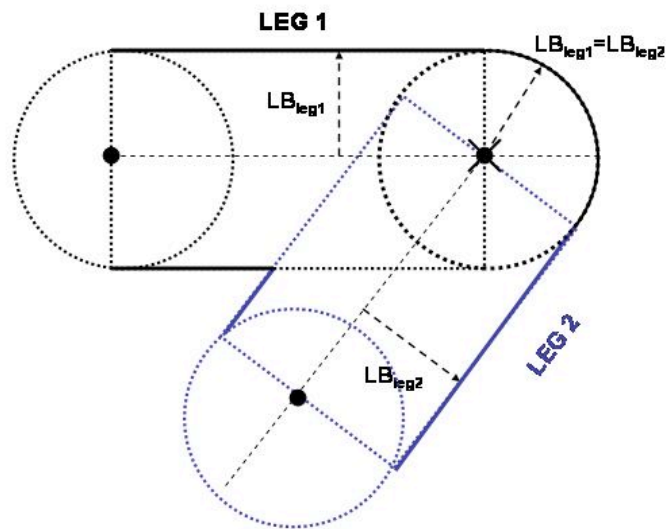


Figure 4: Large Change in Direction (Lateral Boundary Unchanged)

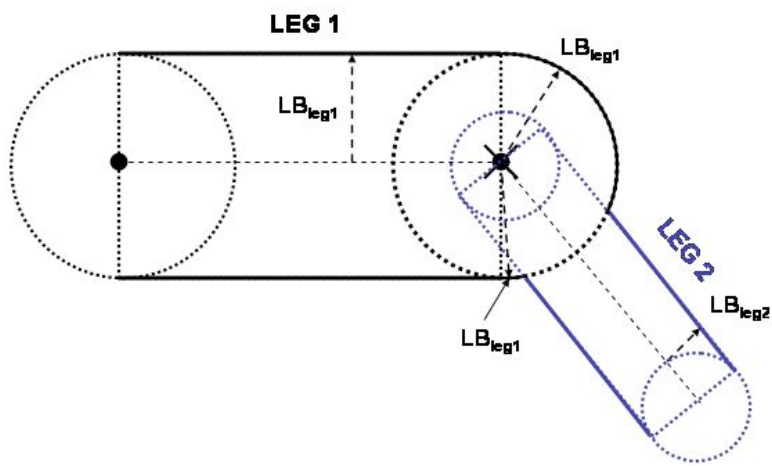


Figure 5: Change in Direction and Lateral Boundary

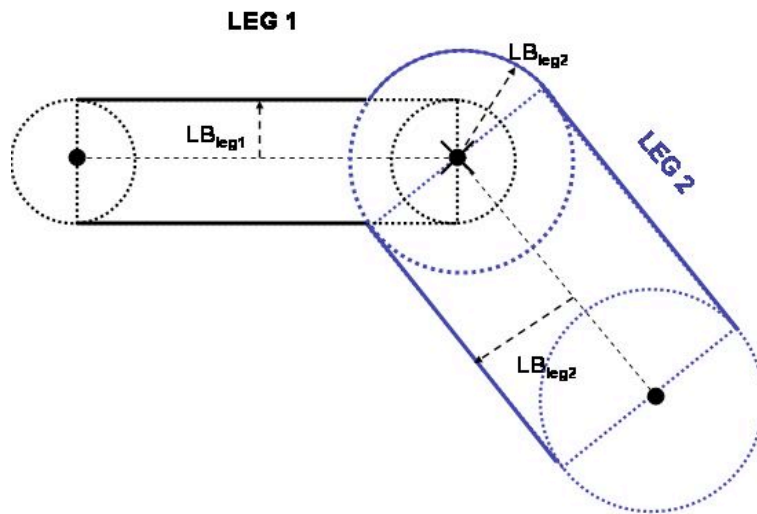


Figure 6: Change in Direction and Lateral Boundary